REMARKS:

Minor corrections have been entered in the claims to overcome the points raised by the Examiner under 35 U.S.C. 112 and in the claim objections.

In addition Claim 1 has been extensively revised so as to more clearly point out the features of the invention and to ensure consistency of language throughout and to provide proper antecedent for all terms. This amendment is extensive but is believed to present a claim that is now fully clear and is fully distinguished from the prior art cited by the Examiner.

In addition Claim 15 has been added which includes all of the features of Claim 1 and is therefore also distinguished from the prior art by the same features as discussed hereinafter. Yet further Claim 15 includes a feature that the drive transmission provides a fixed ratio, as opposed to the variable ratio of the prior art so that claim 15 is yet further distinguished form the prior art.

Turning therefore to the prior art of Brocas cited by the Examiner under 35 U.S.C. 102, the Examiner has pointed to the first auger flight which is item 8 and the second auger flight which is indicated at item 58. The Examiner has omitted from the analysis the cutting device 7 of Brocas.

The device of Brocas provides an arrangement which includes a cutting device at the lower end together with a helical flight of an auger system which acts to clear the cut material. This is clear in the description at column 2, lines 56 to 58 which specify that the item 7 is a cutter and the item 8 is a clearing device.

It will be understood from the drawings that the cutting diameter of the cutting device 7 is equal to the outer diameter of the auger flight. This is explained in the patent at Column 4 line 14 to 43 where it is stated "*Once the cutter has opened up a hole to a stage where part of the helix 8 has entered the hole*". In other words, the cutter cuts the hole and the helix merely enters it so that the helix cannot be larger than the cutter.

The intention is that the cutting device is driven at a first rate to provide a cutting action and thereafter the auger is driven at a required speed to carry the material away so that it remains cleared at all times. Thus the speed rate of rotation of the clearing auger and the cutting device can be varied to provide the required cutting action and the clearing action as independent items. The cutting device is driven in a opposite direction from the clearing device with the effect that the torque generated by the cutting device is in the opposite direction to the torque generated by the clearing device. This will generate opposing torques which will in some cases lead to a reduction of the net torque.

However it is fully clear that the cutting action effected by device 7 generates a hole having a cutting diameter equal to the clearing diameter of the auger flight. Thus the auger flight of the clearing device 8 causes no cutting action since it merely enters a cut hole generated by the cutting device.

The Examiner has pointed to the small pilot auger 58 and has suggested that this constitutes the second auger of the present device. However

this pilot auger is not the primary cutting device and it merely forms a tiny central hole to act as a mere guide. The actual cutting action of the cutting device 7 is effected by the elements 55 and 56 which are of course much larger in external diameter than the pilot auger 58. Such augers or tapered drill bits which act to form a pilot hole are of course well known in many drilling and cutting devices and is well known that the pilot auger does not provide the actual cutting effect to the cutting diameter, which is instead caused by the cutting device itself.

The present invention is clearly different from this arrangement both in construction and effect.

In the present invention there are first and second cutting devices. Each of these is formed by a helical flight with a cutting arrangement at its leading end. Each of these has a cutting arrangement which cuts a hole where the hole cut is equal in diameter to the exterior diameter of the helical flight.

In the present invention the second cutting device, with its cutting arrangement, is axially in advance of the first cutting device with its separate cutting arrangement. The second cutting device acts to cut a first smaller hole which is equal in diameter to its helical flight so that the material is carried away by its helical flight. Axially behind that second cutting device is the first cutting device which has its own cutting arrangement and cuts an additional hole outside the first hole to a larger diameter than the first hole. The first cutting device at its axially retarded position thus actually cuts an additional hole around the hole cut by the second cutting device and thus has its own cutting arrangement.

In addition to this arrangement, the rotation speed ratio of the two cutting devices is arranged so that the torque generated by them in their cutting action is balanced in the opposed directions.

Clearly in Brocas the first cutting device 7 cuts a hole which is the intended size of the completed hole. Thus the clearing device 8 in the form of the helical flight has no cutting action at its leading edge and does not cut a hole of increased diameter or at all.

Claim 1 has been amended therefore to refer to the first and second cutting devices and to set forth the characteristics of those devices.

It is submitted that a proper interpretation of Claim 1, when applied to the arrangement of Brocas, should be interpreted in that the first cutting device of the claim is equivalent to the element 8 of Brocas and the second cutting device is equivalent to the element 7 of Brocas. Based upon such an interpretation, clearly the following features of distinction are present and the arrangement of Brocas does not satisfy the definitions set forth in respect of these first and second cutting devices.

In particular, Claim 1 has been amended therefore to include the following features of distinction from the prior art.

a) There are first and second cutting devices, whereas in Brocas there is only a single cutting device with a clearing device.

b) The outermost cutting diameter of the second cutting device has a cutting diameter equal to the diameter of the helical flight of the second cutting device and the helical flight is arranged to carry the cut material from the cutting arrangement. Clearly in Brocas the outermost cutting diameter of the cutting device 7 is significantly greater than that of the helical flight 58. Clearly the helical flight 58 is not arranged to transport material cut by the cutting device 7.

c) The first cutting device is arranged to cut a hole which is larger in diameter than that of the second cutting device. In Brocas clearly the element 8 which is the clearing device does not cut a hole at all and even if it were to effect some cutting action, it would not cut a hole which is larger than the hole cut by the second cutting device which is the item 7.

It is submitted therefore that based on a proper reading of claim 1 it is clearly distinguished from Brocas at least by the above features.

In the alternative, if the Examiner looks merely at the pilot auger 58 and suggests that this item alone constitutes the second cutting device, ignoring the existence of the cutting device 7, then a number of other features of distinction must be considered as follows:

a) The first cutting device, which rotates in an opposite direction to the second cutting device, has a cutting arrangement which cuts an annular cutting portion outside the hole cut by the second cutting device (which in this analysis is the pilot auger 58). In Brocas the annular hole surrounding the hole cut by the item 58 is cut by the cutting device 7 but this which rotates in the same direction as the pilot auger 58. The clearing device 8 of Brocas does not include a cutting arrangement and cannot cause any cutting since the hole is already cut by the device 7. Brocas therefore fails to disclose this arrangement, if one considers the pilot auger 58 is the first cutting device.

b) The claim now states that the drive assembly is arranged to drive the first cutting device at a first speed and to drive the second cutting device at a second speed with the first and second speeds arranged such that torque generated by the cutting action of the first cutting device in one direction substantially balances torque generated by the cutting action of the second cutting device in the opposite direction.

If, in this contorted analysis of the claim, one considers the second cutting device as the pilot auger 58 and one considers the first cutting device as the clearing device 8 on Brocas, then Brocas still fails to satisfy these features in that:

the first cutting device (item 8) does not provide any cutting action;

and there is consequentially no disclosure in Brocas that torque generated by a cutting action of the clearing device 8 substantially balances torque of the pilot auger 58.

Clearly Brocas is concerned with balancing torque between the cutting action of the device 7 and the clearing action of the auger 8. There is simply no discussion in Brocas of any torque generated by the cutting action of the pilot auger 58. This is of course minimal and irrelevant in comparison with the vigorous cutting action of the device 7.

It is submitted therefore that on a careful reading of amended Claim 1 this is clearly distinguished from Brocas, whether Brocas is looked at from the point of view of cutting device 7 as equivalent to the second cutting device of the present invention or whether one looks at Brocas from the point of view of the pilot auger 58 forming the second cutting device of the present invention. Based upon either interpretation, Claim 1, when given the necessary careful analysis, distinguishes from the arrangement of Brocas.

The Examiner has not rejected Claim 1 under 35 U.S.C. 103. However it is submitted that amended Claim 1 is not obvious in view of Brocas since Brocas fails to disclose the concept of providing a first cutting action with a

first auger and second cutting action with a second auger where the first auger is larger and retarded relative to the first auger. As set forth hereinbefore, Brocas provides a cutting device 7 which effects all of the cutting and merely a clearing auger behind that cutting device. There is only a single cutting device and not the two cutting devices as set forth in the present invention. There is no suggestion in Brocas that the cutting device 7 should be reduced in cutting diameter or that the clearing auger 8 should itself form a cutting device.

In the present invention the high torque normally generated when cutting for example in frozen ground, is reduced for the operator at all times during the operation. In an initial part of the operation, where the cutting is effected solely by the second cutting device, the hole being cut is small (say four inches in diameter relative to the final hole of say eight inches) so that the torque is low and easily manageable. As soon as the first auger reaches the ground, and commences cutting to the full diameter, the torque is substantially balanced so that the net torque is low or zero.

In Brocas, the hole is first cut as the cutting device 7 engages the ground with the clearing device 8 stationary. Thus immediately the full maximum torque is applied on the operator. Only when the clearing commences is there some balancing of the torque by the clearing effect. No torque is generated by a cutting effect of the clearing device 8 since there is no cutting action.

Brocas simply does not disclose nor suggest the splitting of the cutting effect for balancing torque. The provision of the pilot auger 58 does not disclose this concept since pilot augers are merely a guide as is well known.

It is submitted therefore that the whole concept behind the present invention is entirely absence in Brocas and therefore a rejection under 35 U.S.C. 103 is not proper.

Respectfully submitted

BRIAN MAKI

PER:
Adrian D. Battison
Registration No: 31,726

ADB/ll
April 28, 2006
Adrian D. Battison

Winnipeg, Manitoba, Canada
Telephone (204) 944-0032 - FAX (204) 942-5723

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LYNN LEATHERDALE

Lynn Leatherdale